

FAA NDE R and D

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Structural Integrity Forum
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Federal Aviation
Administration



Research Charter

- **Title 49 USC requires FAA to:**
 - Develop, modify, test, and evaluate systems, procedures, facilities, and devices to meet the needs of safe and efficient aviation.
 - Set minimum safety standards and means of compliance for rules governing design, maintenance, and operations.
- **FAA research mission was expanded by the Aviation Safety Research Act of 1988.**



FAA Inspection Research Program History

- **Initiated in 1989 in response to Aloha Airlines Flight 243**
- **Part of the National Aging Aircraft Research Program**
- **Managed by the FAA's Technical Center, Atlantic City , NJ**
- **Inspection activities occurred at 2 major research centers:**
 - Center for Aviation Systems Reliability, Iowa State University with Wayne State and Northwestern University
 - Charged with developing improved inspection methods
 - Developing simulation and modeling tools
 - Inspection training materials
 - Airworthiness Assurance NDI Validation Center, Sandia National Labs
 - Charged with validation of new technologies & reliability studies
 - Establishing a realistic maintenance test environment
 - Full scale test specimen library
 - Facilitating tech transfer of improved equipment, procedures, & practices



FAA Research Process

- **Sponsor-generated research requirements**
- **Internal sponsors from the FAA's Office of Aviation Safety (AVS) Comprising the Aircraft Certification Service and Flight Standards Service identify and define research requirements**
- **Sponsors work in teams called TCRGs organized by technical discipline. TCRG = Technical Community Representatives Group**
- **All research requirements are ranked and prioritized by AVS (POC: Robert Pappas)**
- **Funds distributed by priority until gone.**
- **Typically, a 3-year process: A requirement approved in FYXX will receive funding in FYXX+3**
- **Process allows for "Pop-up" requirements to be funded quicker**



Applicable TCRGs

- **Maintenance & Inspection (M&I) TCRG**
- **Structural Integrity of Metallics (SIM) TCRG**



Aging Aircraft to Continued Airworthiness

- Historically, Inspection Issues Focused on Aluminum Structures
 - Detection of cracks & WFD from fastener holes in multiple layers
 - Disbonding of tear straps and bonded doublers
 - Lap joint corrosion
- Recent Shift Toward Inspection for Continued Airworthiness of Advanced Materials and Processes
 - Research to consider:
 - Large Area, Rapid Inspection of Composites for Impacts
 - Ability to Characterize Composite Damage and Repairs
 - Detection and Characterization of Environmental Damage
 - Ability to Characterize Adhesive Bond Conditions
 - Ensure integrity of new manufacturing methods
 - Remote and Embedded Sensors for Structural Monitoring



Industry and Inter-Agency Coordination

- Aging Aircraft Nondestructive Inspection Working Group (AANWG)
- ATA NDT Network
- National Science and Technology Council (NSTC) Nondestructive Evaluation (NDE) Communication Group
- Joint Council on Aging Aircraft (JCAA)
- SAE Commercial Aircraft Composite Repair Committee (CACRC)
- Annual Joint FAA/NASA/DOD Conference on Aging Aircraft (now known as the Airworthiness Assurance and Sustainment Conference)



Inspection Research Management

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Questions?

